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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,625	08/01/2003	Akira Terao	SPRCP012	4753
22434	7590	05/03/2007		
BEYER WEAVER LLP			EXAMINER	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/632,625	<b>Applicant(s)</b> TERAO ET AL.	
	<b>Examiner</b> Anthony Fick	<b>Art Unit</b> 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 February 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-10 and 12-20 is/are allowed.
- 6) ☒ Claim(s) 11 and 21-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                            |                                                                                         |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 27, 28 and 29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 27, 28 and 29 all contain the language "at least some of the plurality" with regards to a secondary reflector, a secondary photovoltaic element or both. Applicant's original specification states a secondary optical element can be provided with each receiver (paragraph 0009), and a secondary mirror can be placed near the focus of each parabolic mirror (paragraph 0024). The original claims also include language for providing an optical element with each cell (claim 9). It is the examiner's position that the use of "each" within the specification is directed toward an embodiment of every cell/receiver/mirror having the secondary optical element as the embodiment of claim 9. The specification does not provide any support for embodiments wherein only some of the cells/receivers/mirrors have secondary optical elements. Thus the broadening language of "at least some of the plurality" within claims 27, 28 and 29, is not supported by the original specification and is deemed new matter.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 11 and 21 through 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Stern et al. (U.S. 5,344,496).

Stern discloses a lightweight solar concentrator cell array as shown in figures 2, 3 and 4.

Regarding claim 11, figures 3 and 4 show a photovoltaic module comprising a plurality of radiation reflectors each comprising an asymmetric portion of a parabolic or similarly shaped surface, the plurality being serially arranged and a plurality of photovoltaic cells, 22. Figure 3 shows that each cell is shielded from direct radiation by an adjacent reflector and with the corresponding reflector directing off-axis radiation to the cell (dotted lines in figure 3). The reflectors shown in figure 3 have an appendage, 26, that could allow mounting of a cell. Further, as Stern discloses attachment of the cells to the reflectors, the means of attachment, adhesives, bonding, etc., read on an appendage for mounting a cell.

Regarding claim 21, figures 3 and 4 show a radiation reflector comprising an asymmetric portion of a parabolic or similarly shaped surface. Figure 3 shows the reflector directing off-axis radiation to or from the focus of the surface (dotted lines in figure 3).

Regarding claim 25, Stern discloses the reflectors are a formed material with a reflective surface, and the material itself is cured to be reflective (column 4, paragraph 3).

Regarding claims 22, 23 and 24, Stern further discloses the reflectors can include a reflective coating of aluminum or silver (column 4, paragraph 3).

Regarding claim 26, the reflector shown in figure 3 has an appendage, 26, that could allow mounting of a receiver or transmitter. Further, as Stern discloses attachment of the cells to the reflectors, the means of attachment, adhesives, bonding, etc., read on an appendage for mounting a receiver or transmitter.

***Allowable Subject Matter***

5. Claims 1 through 10 and 12 through 21 are allowed.

6. The following is an examiner's statement of reasons for indicating allowable subject matter: independent claims 1 and 12 require a plurality of radiation reflectors, the reflectors each having an asymmetric portion of a parabolic or similarly shaped surface having a vertically and a longitudinally curved configuration, and the reflectors shielding direct radiation from a transmitter or receiver and directing off-axis radiation to/from the transmitter or receiver. The closest prior art is Stern et al. (U.S. 5,344,496).

Stern discloses a lightweight solar concentrator cell array as shown in figures 2, 3 and 4.

Regarding claim 1, figures 3 and 4 show a photovoltaic module comprising a plurality of radiation reflectors each comprising an asymmetric portion of a parabolic or similarly shaped surface, the plurality being serially arranged and a plurality of

photovoltaic cells, 22. Figure 3 shows that each cell is shielded from direct radiation by an adjacent reflector and with the corresponding reflector directing off-axis radiation to the cell (dotted lines in figure 3).

Regarding claims 2 and 3, Stern discloses the reflectors are a formed material with a reflective surface, and the material itself is cured to be reflective (column 4, paragraph 3).

Regarding claims 4, 5, and 6, Stern further discloses the reflectors can include a reflective coating of aluminum or silver (column 4, paragraph 3).

Regarding claim 7, figure 2 shows the reflectors formed as one unit.

Regarding claim 10, figure 3 shows the photovoltaic cells are located at or near the focus of the reflector (column 4, paragraph 1).

Regarding claim 12, figures 1 and 2 show a radiation reflector array comprising a plurality of reflectors arranged in rows and columns each reflector comprising an asymmetric portion of a parabolic or similarly shaped surface. Figure 3 shows the reflectors direct radiation to or from a focus hidden behind an adjacent reflector with the radiation being off-axis with respect to the reflector.

Regarding claim 13, Stern discloses the reflectors are a formed material with a reflective surface, and the material itself is cured to be reflective (column 4, paragraph 3).

Regarding claims 14, 15, and 16, Stern further discloses the reflectors can include a reflective coating of aluminum or silver (column 4, paragraph 3).

Regarding claim 17, figure 2 shows the reflectors formed as one unit.

Regarding claim 18, figure 3 shows the radiation is transmitted to or from the focus of the reflector (column 4, paragraph 1).

Regarding claim 20, the reflectors shown in figure 3 have an appendage, 26, that could allow mounting of a receiver or transmitter. Further, as Stern discloses attachment of the cells to the reflectors, the means of attachment, adhesives, bonding, etc., read on an appendage for mounting a receiver or transmitter.

While Stern does disclose the device described above, figure 2 shows the reflectors having only a vertically curved configuration with a straight longitudinal configuration. This configuration allows the reflectors of Stern to be placed into an array and allows larger sized reflectors to act as heat sinks for the attached solar cells. The increased size of the reflectors increases the amount of heat that they can absorb, thus keeping the solar cells at lower temperatures to improve solar cell efficiency. It would not be obvious to alter the configuration of Stern to curve the reflectors in the longitudinal direction as well because this would reduce the mass of the reflectors and not allow them to operate as efficient heat sinks. Therefore one skilled in the art would not make such a choice and it would destroy the invention of Stern.

The other reflectors within the art that have vertical and longitudinal curved configurations are utilized with solar cells placed directly in the center of the curved surface and does not block the cell from receiving direct radiation. Therefore these reflectors do not meet the requirements of the claims. Thus the claims are allowable over the prior art. The remaining claims all depend from claims 1 and 12 and are allowable for the same reasoning.

***Response to Arguments***

7. Applicant's arguments filed February 6, 2007 in regards to claims 11 and 21 through 26 have been fully considered but they are not persuasive. Applicant argues that claims 21 through 26 are dependent on claim 12 and should be allowable for the same reasoning as 12. However these claims are not dependent on claim 12 and the rejections are maintained.

Applicant argues that the reference to Stern does not disclose the appendage required in claim 11. The examiner respectfully disagrees. The definitions for appendage include a subordinate part attached to something, or something added or attached to an entity of greater importance or size (see printouts from Dictionary.com). The adhesives or bonding described by Stern would be a part attached to something or something added to an entity of greater size, and thus meet the definition of an appendage. Therefore the rejection is maintained.

Applicant's amendments to claims 1 and 12 have overcome the previous rejections as stated above.

***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within



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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Fick whose telephone number is (571) 272-6393. The examiner can normally be reached on Monday - Friday 7 AM to 4 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Anthony Fick  
AU 1753  
April 26, 2007

*ADF*

  
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